ARMY MULTIFUNCTIONAL INFORMATION DISTRIBUTION SYSTEM-LOW VOLUME TERMINAL 2 (MIDS-LVT 2)

The Army Multifunctional Information Distribution System-Low Volume Terminal 2 (MIDS-LVT 2) provides Link 16 digital data communications to Air and Theater Missile Defense Command and Control (C2) host systems. Link 16 provides a common relevant operational picture of theater air activity via a robust, jam-resistant network for Joint and Multinational Force data sharing.

The Army MIDS System includes the MIDS-LVT 2 terminal, the Joint Tactical Information Distribution System (JTIDS)/MIDS-LVT 2 Terminal Controller (TC), and the antenna. The TC consists of specialized software hosted on a personal computer and provides initialization and status monitoring functions.

Planned MIDS-LVT 2 host platforms include the Theater High Altitude Area Defense (THAAD) System, the PATRIOT Information and Coordination Center (ICC) and Battery Command Post (BCP).

BACKGROUND INFORMATION

The Army procured the JTIDS Class 2M terminal and fielded it in Forward Area Air Defense (FAAD) C2 systems and PATRIOT ICCs. The Army concluded acquisition of the JTIDS Class 2M terminal and intends to satisfy the remaining host platforms' Link 16 requirements with MIDS-LVT 2. MIDS-LVT 2 shares some common components with MIDS-LVT 1 but has less functionality. For example, MIDS-LVT 2 does not have Link 16 digital voice or Tactical Air Navigation.

The Army conducted a MIDS-LVT 2 Limited User Test (LUT) during FY99. This test revealed a number of critical technical and operational deficiencies with the EMD MIDS-LVT 2 terminal, TC, Link 16 network initialization, operator training, message handling, displays, and Built-In Test.

During 3QFY00, the Army initiated LRIP. These LRIP terminals will support host platform integration, engineering, and IOT&E scheduled for 3QFY02. A MIDS-LVT 2 full-rate production decision is planned for 4QFY02.

TEST & EVALUATION ACTIVITY

In 2001, the Army conducted a 30-day reliability DT of EMD terminals, a three-day confirmatory DT event, and a MIDS-LVT 2 Functional Verification Test (FVT). The confirmatory test examined corrective actions to LUT deficiencies. The FVT was conducted using hardware-in-the-loop laboratory and host platform assets, along with test and scenario simulation tools. The objective of the FVT was to demonstrate the capability of THAAD, PATRIOT, and FAAD systems to interface with MIDS-LVT 2.

MIDS-LVT 2 BCP integration, as well MIDS-LVT 2 integration into THAAD, is unique because the TC function is integrated into the host platforms' computers and displays. This configuration will eliminate the TC, a source of numerous deficiencies, from the system.

TEST & EVALUATION ASSESSMENT

Although a robust schedule of DT is planned for FY02, there are no operational test (OT) events prior to Army MIDS IOT&E. The absence of a combined DT/OT or dedicated OA event presents risk for a successful IOT&E. The IOT&E will evaluate MIDS LRIP terminals integrated into the PATRIOT ICC and BCP, a new host platform for Link 16. The BCP will initially be fielded with JTIDS; however, this integration will not have been evaluated in an OT.

Lessons from previous Army Link 16 tests indicate reliability challenges for systems operated and maintained by soldiers in field conditions. Because of these potential trouble areas, DOT&E has recommended that the Army develop a pre-IOT&E OT event to determine the risk to successful IOT&E.

In a reliability test, MIDS-LVT 2 demonstrated a reliability point estimate of 432 hours Mean Time Between Failure (MTBF). MIDS-LVT 2 failed to operate consistently when coming out of cold temperature cycles and there were hardware failures requiring replacement. These results indicate that MIDS-LVT 2 did not meet the 1,000-hour threshold requirement and there is risk that MIDS-LVT 2 will fail the operational reliability requirement of 393 hours MTBF.

While the DT events indicated that many of the LUT deficiencies had been corrected, 13 new deficiencies, ranging from physical safety to message handling were discovered. The most serious include incorrect processing of the Link 16 theater missile defense space track message by MIDS-LVT 2. The processing of the space track message results in track velocity and positional errors, and may result in critical delays in engagement of incoming theater ballistic missiles.

More emphasis should be placed on training. Operation in a Link 16 network is complex and requires sustainment training for the users to maintain skills. The LUT indicated shortfalls in network monitoring and troubleshooting. Evaluations of other Service MIDS have also identified training deficiencies. In general, Link 16 operators are not afforded adequate practice with the actual hardware and software they will operate in the tests or in the field.

Link 16 joint interoperability is ensured by adherence to the common Link 16 waveform, standard message sets, and Link 16 network designs. During FY00 tests, it was apparent that incorrect host platform implementation of Link 16 messages resulted in loss of mission functionality in other Link 16 network participants. DOT&E will continue to stress early and complete Link 16 interoperability certification, for the host platform, before entry into IOT&E. This certification will be followed by live operational test events, with most events leveraged on Joint Field Training Exercises, and include evaluation of Link 16 network and message interoperability.